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EXAMINER
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ZIMMERMANN, JOHN P

ART UNIT	PAPER NUMBER
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2861

NOTIFICATION DATE	DELIVERY MODE
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02/04/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM  
ipa.mail@hp.com  
laura.m.clark@hp.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,974	<b>Applicant(s)</b> RODIN ET AL.	
	<b>Examiner</b> John P. Zimmermann	<b>Art Unit</b> 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 2,3 and 14-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-9 and 13 is/are rejected.
- 7) ☒ Claim(s) 10-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12 April 2007</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. **Claims 2-3, & 14-31** are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Invention or Species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 03 November 2009.
2. Applicant's election with traverse of Group I, Species D (2), an ink-jet printing process in the reply filed on 03 November 2009 is acknowledged. The traversal is on the ground(s) that the “Examiner has Not Established a *Prima Facie* Case for the Election Requirement,” and that “No Valid Reason Exists for Dividing Among the Related Inventions. This is not found persuasive because Groups II-IV are all apparatuses while Group I is a process. As put forth in the original election requirement, they do not relate to a single general inventive concept under PCT Rule 13.1 *because* “under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The groups listed above are not within the permitted combination of different categories of inventions.” Additionally, as previously stated, the special technical features listed are independent of each group, not corresponding between the groups. Finally, because the claims are drawn to more than one of the permitted combinations of categories, and there is claimed more than one invention in each category [i.e. three apparatuses and one process] restriction to a single invention is permitted, see 37 C.F.R § 1.475.

The requirement of restriction concerning Groups I-IV and the Species is still deemed proper and is therefore made FINAL.

***Priority***

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

***Specification***

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Digital Ink Jet Printing and Curing Radiation Application Method.

***Claim Objections***

5. **Claim 13** is objected to because of the following informalities: There appears to be a missing word in the fourth line of the claim. The line reads "...directing the first and second split radiation portions via a mirror's assembly towards" the word "rotatable" appears to have been inadvertently left out of the line, with its location immediately prior to mirror's. As understood from the fifth line of the claim, line four should read: "directing the first and second split radiation portions via a rotatable mirror's assembly towards." Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

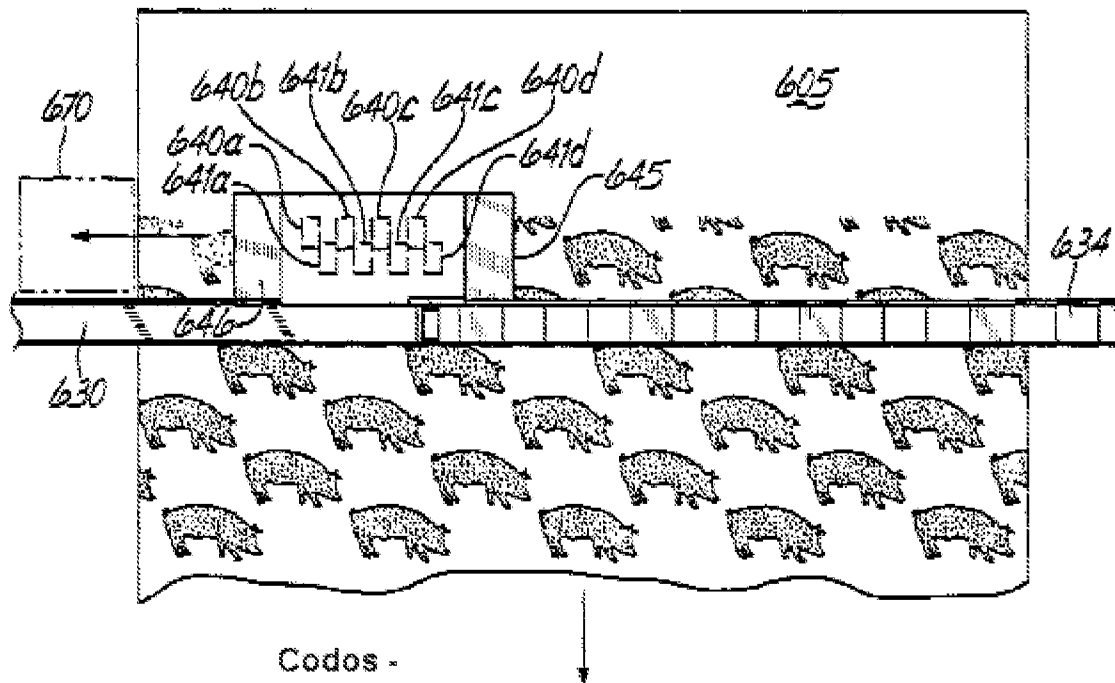
7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

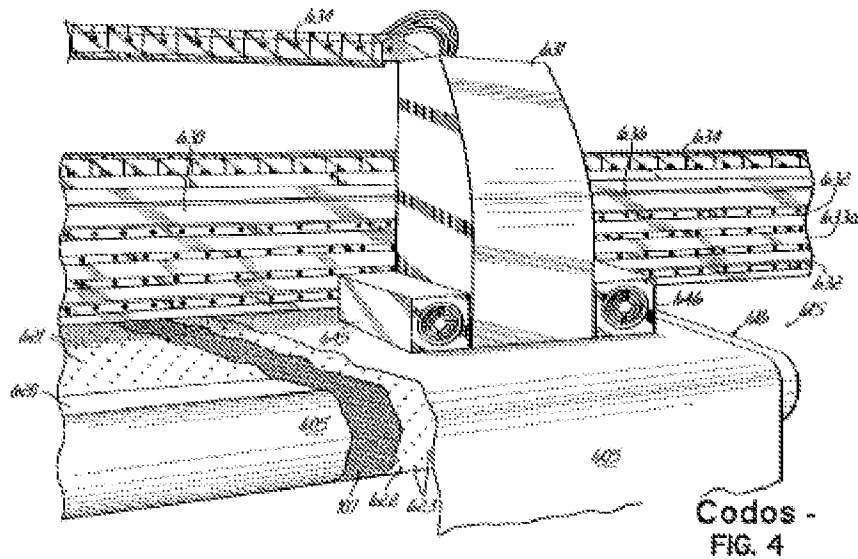
9. **Claims 1 & 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Codos** (US 2002/0044188 A1) in view of **Caiger et al.** (US 6,145,979 A).

a. As related to independent **claim 1** Codos teaches a method for use in a digital ink-jet printer (Codos – Title and Abstract), the method comprising: continuously applying a radiation-curable ink to successive locations on a substrate along a print line extending across the substrate (Codos – Title; Abstract; Detailed Description, Page 10, Paragraphs 80-81; and Figure 5, Reference #640 & #641, shown below).

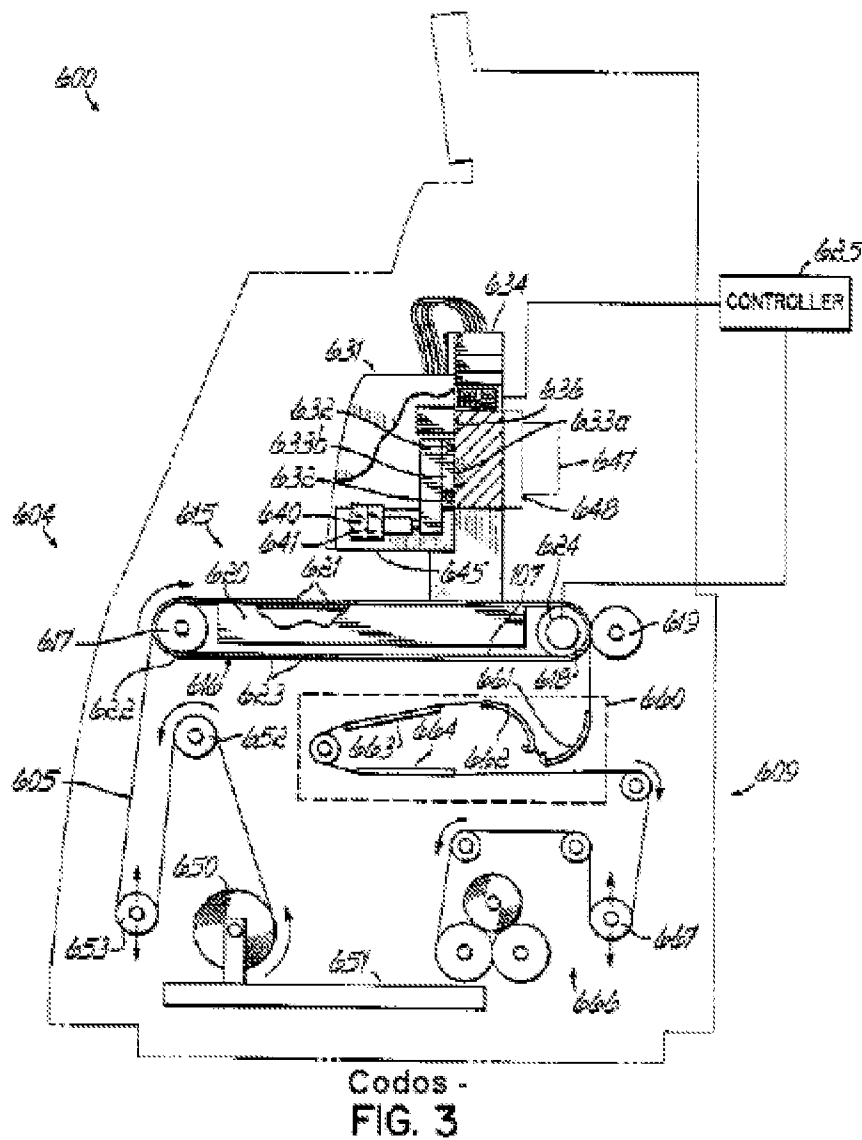


Codos -  
**FIG. 5**

b. Continuing with **claim 1**, Codos teaches concurrently with the continuous application of the radiation-curable ink along the print line, continuously applying first curing radiation of a predetermined first intensity to the applied ink on the successive locations on the substrate along said print line, with a certain time delay, constant for all the locations on the substrate, between the applications of ink and the first curing radiation (Codos – Detailed Description, Page 10, Paragraph 82 and Figure 4, Reference #645 & #646, shown below).



c. Continuing with **claim 1**, Codos teaches applying second curing radiation of a predetermined intensity to the locations on the substrate a certain time period, constant for all the locations on the substrate, after the application of the first curing radiation to said locations (Codos – Detailed Description, Page 10, Paragraph 82 and Figure 3, Reference #648 & #647, shown below).

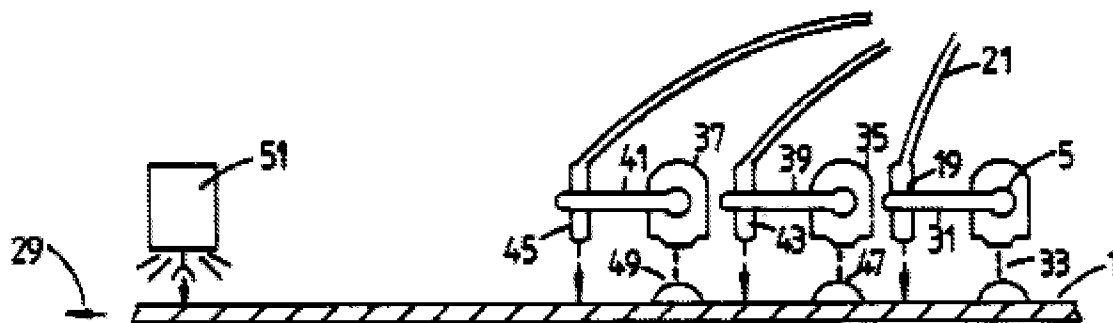
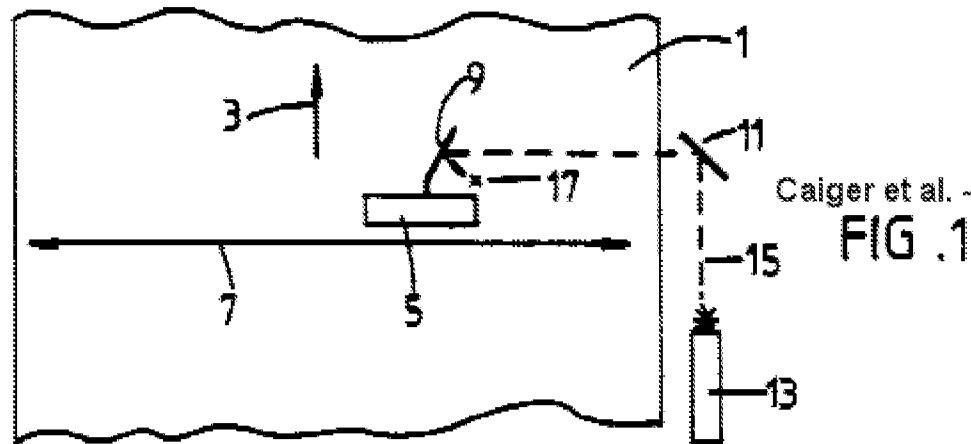


d. Continuing with **claim 1**, Codos *does not* specifically teach the second curing radiation has a predetermined second intensity. *However*, Caiger et al. teaches a method for use in a digital ink-jet printer (Caiger et al. – Title and Abstract), the method comprising: continuously applying a radiation-curable ink to successive locations on a substrate along a print line extending across the substrate (Caiger et al. – Title; Abstract; Description, Column 1, Lines 38-61 & Column 3, Lines 20-30; and Figure 1, Reference



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#13, #15, & #17, shown below), while applying a first and a second curing radiation of a first and a second intensity (Caiger et al. – Title; Abstract; Description, Column 4, Lines 10-30; and Figure 5, Reference #19, #43, #45, & #51, shown below).

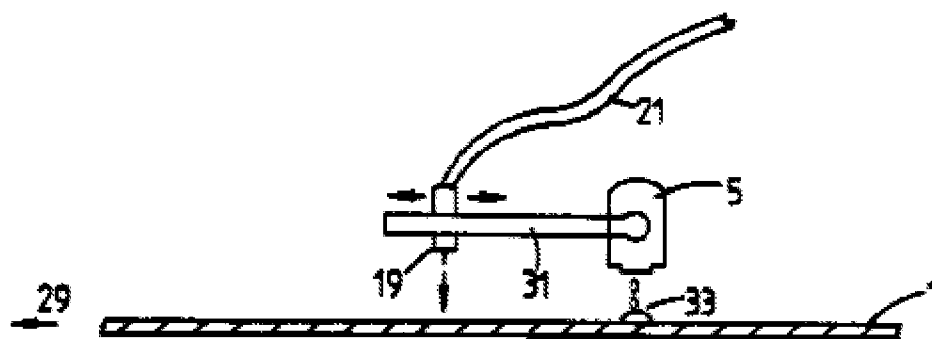


Given the same field of endeavor, specifically a digital printing method with an in application step and two curing radiation application steps, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method of curing radiation-curable ink with two radiation application steps as taught by Codos with method of curing radiation-curable ink with two radiation application steps that include various radiation intensities as necessitated by the specific application point and curable ink as taught by Caiger et al., in an effort to provide an ink-

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jet printing method which semi-hardens/fixes the ink droplets to control spread and merging and subsequently provide complete curing of the printed image using the appropriate, specific radiation sources (Caiger et al. - Description, Column 4, Lines 15-30).

e. As related to dependent **claim 5** and further dependent **claim 6**, the combination of Codos and Caiger et al. remains as applied above and continues to teach the radiation curable ink is applied to successive locations along the first and second successive print lines on the substrate in a first and second opposite directions, respectively [i.e. a scanning printhead carriage] (Codos - Figure 5, Reference #640, #645, #646, shown above and Caiger et al. - Figure 1, Reference #5, #17, & #7, shown above), and the application of the first curing radiation comprises selectively directing the curing radiation, generated by a curing source, to the successive locations on the print line on the substrate in the first or second opposite direction [i.e. radiation source is on or follows the carriage] (Codos - Figure 5, Reference #640, #645, #646, shown above and Caiger et al. - Figure 4, Reference #5, & #19, shown below).



Caiger et al. -  
FIG. 4

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10. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Codos** (US 2002/0044188 A1) and **Caiger et al.** (US 6,145,979 A) as applied to **claim 1** above in view of **Nunez et al.** (US 6,630,083 B1).

The combination of Codos and Caiger et al. remains as applied above but *does not* teach the specific difference in intensity between the first and second intensities. *However*, Nunez et al. teaches a method of curing a radiation curable substance using two different radiation sources the first of which provides a first intensity [i.e. a low intensity UV light] and the second of which provides a second intensity [i.e. a high intensity UV light], wherein the first intensity is 15% or less than that of the second intensity (Nunez et al. - Description, Column 1, Lines 44-55 and Column 2, Lines 5-15). Given the related field of endeavor, specifically a two step curing radiation application method, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method of curing radiation-curable ink with two radiation application steps as taught by the combination of Codos and Caiger et al., with the method of curing a radiation-curable substance with two radiation application steps that include a specific low and high radiation intensity as taught by Nunez et al. in an effort to provide a radiation curing method which maintains the rate of polymerization as low as possible in order to avoid shrinkage induced defects (Nunez et al. - Description, Column 2, Lines 11-15).

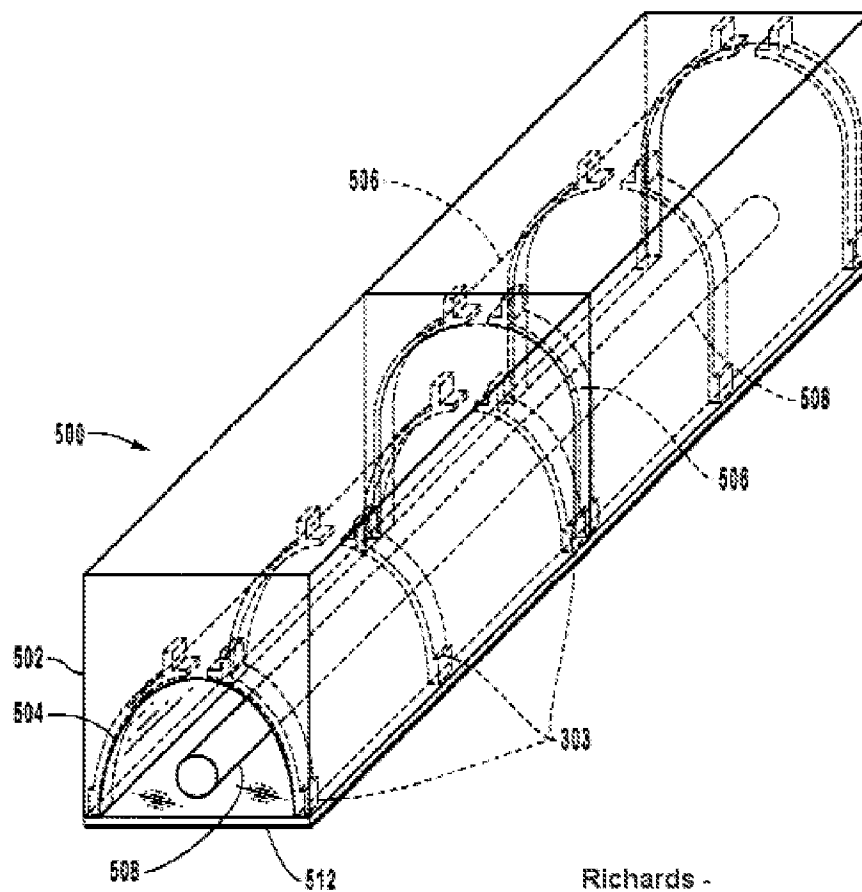
11. **Claims 7 & 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Codos** (US 2002/0044188 A1) and **Caiger et al.** (US 6,145,979 A) as applied to **claim 1** above in view of **Richards** (US 6,739,716 B2).

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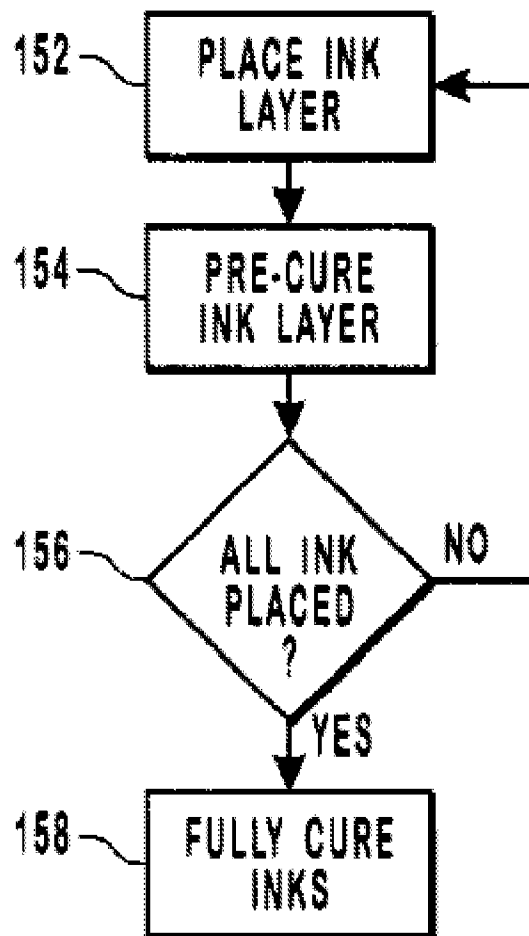
As related to dependent **claim 7** and further dependent **claim 9**, the combination of Codos and Caiger et al. remains as applied above and continues to teach the first and second curing radiation being concurrently directed to spaced apart locations on the substrate both spaced from a location to which the ink is applied, the combination **does not** specifically teach splitting the curing radiation, generated by a single radiation source, into first and second radiation portions in a predetermined power ratio. **However**, Richards teaches a method for applying curing radiation at multiple power/intensity levels a space-apart locations on the substrate both spaced from a location to which ink is applied by splitting the curing radiation, generated by a single radiation source, into first [i.e. pre-cure] and second [i.e. cure] radiation portions in a predetermined power ratio (Richards – Title; Abstract; Detailed Description, Column 3, Lines 61-68; Column 4, Lines 1-5, Lines 30-35; Column 5, Lines 45-60; Column 6, Lines 45-50; Column 7, Lines 23-36; and Column 8, Lines 40-54; and Figures 5 & 10, Reference #506, #504, #508, #154, & #158, both shown below), wherein the splitting is wavelength-selective (Richards – Detailed Description, Column 8, Lines 40-54). Given the same field of endeavor, specifically a digital printing method and a two step curing radiation application method, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method of curing radiation-curable ink with two radiation application steps as taught by the combination of Codos and Caiger et al., with the method of curing a radiation-curable ink with two radiation application steps that include different radiation intensities or different wavelengths as taught by Richards in an effort to provide a radiation curing method

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which cures the ink enough to prevent the ink from running or merging with another ink, but does not prevent the ink from being fully cured, which using only a single radiation source to minimize power consumption and lower risk of heat damage (Richards – Summary, Column 2, Lines 11-51).



Richards ,  
FIG. 5



Richards -  
**FIG. 10**

11. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Codos** (US 2002/0044188 A1) and **Caiger et al.** (US 6,145,979 A) as applied to **claim 1** above in view of **Young** (US 6,561,640 B1).

As related to dependent **claim 8**, the combination of Codos and Caiger et al. remains as applied above but *does not* specifically teach the curing radiations being of different wavelengths. While it was common practice in the art at the time of the invention to provide different wavelength radiation curing sources for various curable substances, the

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combination ***does not*** specifically indicate that variation of the invention. ***However,*** Young teaches a method of printing with radiation-curable ink and applying multiple curing radiations to the printed substrate to partially cure and/or completely cure the substance (Young – Title and Abstract), wherein the first and second curing radiation are of different wavelengths (Young - Title; Abstract; Summary, Column 2, Lines 52-58; Detailed Description, Column 3, Lines 60-67, Column 4, Lines 29-31, Lines 45-50 and 55-59). Given the same field of endeavor, specifically a digital printing method and a multiple step curing radiation application method, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method of curing radiation-curable ink with two radiation application steps as taught by the combination of Codos and Caiger et al. with the method of curing a radiation-curable ink with two radiation application steps that include different radiation intensities or different wavelengths as taught by Young in an effort to provide a radiation curing method which cures the ink in a way to provide control over lateral spread while permitting irradiation with narrow ranges of wavelengths and selective irradiation of multiple substances (Young – Summary, Column 2, Lines 25-29 and Lines 53-58).

12. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Codos**, (US 2002/0044188 A1) **Caiger et al.**, (US 6,145,979 A) and **Richards** (US 6,739,716 B2) as applied to **claim 7** above, and further in view of **Young** (US 6,561,640 B1).

While the combination of Codos, Caiger et al., and Richards remains as applied and continues to teach splitting curing radiation coming from a radiation source into first and second radiations portions presenting first and second curing radiation (Richards –

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Detailed Description, Column 8, Lines 41-54), the combination ***does not*** specifically teach directing the first and second split radiation portions via a rotatable mirror assembly. ***However***, Young teaches a method of printing with radiation-curable ink and applying multiple curing radiations to the printed substrate to partially cure and/or completely cure the substance (Young – Title and Abstract), wherein the first and second split radiation portions are directed via a rotatable mirror assembly towards first and second spaced-apart print lines on the substrate, the rotation of the rotatable mirror providing for directing the respective one of the split radiation portions of successive locations along the print line in either one of the opposite directions (Young - Summary, Column 2, Lines 20-30; Detailed Description, Column 4, Lines 20-65). Given the same field of endeavor, specifically a digital printing method and a multiple step curing radiation application method, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method of curing radiation-curable ink with two radiation application steps as taught by the combination of Codos, Caiger et al., and Richards with the method of curing a radiation-curable ink with two radiation application steps that include different radiation intensities or different wavelengths directed by a rotatable mirror as taught by Young in an effort to provide a radiation curing method which cures the ink in a way to provide control over lateral spread while permitting irradiation with narrow ranges of wavelengths and selective irradiation of multiple substances (Young – Summary, Column 2, Lines 25-29 and Lines 53-58).



*Allowable Subject Matter*

13. **Claims 10-12** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim (independent **Claim 1**) and any intervening claims (dependent **Claims 5-7**).

14. The following is a statement of reasons for the indication of allowable subject matter:

a. As related to dependent **claim 10** and further dependent **claim 11**, a substantial search was conducted and the related art and prior art of record fails to teach or fairly suggest a digital inkjet printing method wherein the directing of the first curing radiation incorporates all of the limitations as currently claimed, particularly, but not limited to directing the first curing radiation coming from the radiation source to **either one of first and second mirrors** accommodated in a spaced-apart relationship **along an axis of the print line at apposite sides of the print head assembly**, each of the first and second mirrors being oriented to reflect radiation impinging thereon towards the location on the print line. While furthermore, directing the radiation to a mirror rotatable between first and second orientations of its reflective surface to face the first and second mirrors.

b. As related to further dependent **claim 12**, a substantial search was conducted and the related art and prior art of record fails to teach or fairly suggest a digital inkjet printing method which selectively directs the curing radiation while incorporating all of the limitations as currently claimed, particularly, but not limited to the curing radiation is selectively directed from the radiation source towards **either one of first and second radiation splitting elements**, each splitting the radiation impinging thereon into first and second radiation portions.

***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nerad et al. (US 2005/0018026 A1) teaches a method for inkjet printing with various radiation curing intensities and/or sources. DeMoore et al. (US 6,973,874 B2) teaches a multiple zone radiation curing system for printing systems. Siegel (US 2006/0121208 A1) teaches radiation curing of ink in an inkjet printing system using multiple radiation sources and multiple wavelengths and intensities.

16. ***Examiner's Note:*** Examiner has cited particular Figures & Reference Numbers, Columns, Paragraphs and Line Numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Zimmermann whose telephone number is (571)270-3049. The examiner can normally be reached on Monday - Thursday, 7:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW LUU/  
Supervisory Patent Examiner, Art Unit  
2861

  
JPZ